DOCUMENT RESUME

ED 037 165 HE 001 380

AUTHOR	Melnick, Murray
TITLE	Independent Study - A Review of the Research Literature.
INSTITUTION	Hofstra Univ., Hempstead, N.Y. Center for the Study of Higher Education.
REPORT NO	R-84
PUB DATE	Sep 69
NOTE	16p.
EDRS PRICE	EDRS Price MF-$0.25 HC-$0.90
DESCRIPTORS	*Effective Teaching, *Higher Education, *Independent Study, Learning Motivation, *Research, *Teaching Methods

ABSTRACT

Independent Study (IND) programs are increasingly favored as part of the generally favorable attitude toward student autonomy. On the basis of experimental evidence, the unhesitating acceptance of IND does not appear to be completely justified. Some research studies found IND superior to traditional methods in terms of learning efficacy; others found IND inferior on those terms. Others concluded there was no difference. The implications of the research are thus inconclusive. In order to get more meaningful results from research studies, more complex questions must be asked, such as: "In what ways is IND superior, for what kinds of students, with what kinds of training, studying what subjects, with what degree of faculty interaction?" (AF)

ED037165

Report No. 84
Sept. 1969

CENTER FOR THE STUDY OF HIGHER EDUCATION

HOFSTRA UNIVERSITY

Independent Study - A Review of the Research Literature

Murray Melnick

Summary

Recent pedagogical practice has favored the development of Independent Study Programs as part of an increasingly favorable attitude toward student autonomy. The unhesitating acceptance of Independent Study (IND) does not, however, appear to be completely justified on the basis of the experimental evidence. A group of research studies relevant to IND were reviewed. Some of these studies showed IND to be superior to traditional teaching methods; other studies concluded IND was inferior; some found no difference. The specific factors responsible for the divergent results were not clearly evident. The discrepant findings may be assigned to differences in method, sample, the exact way in which IND was implemented or variations in the definition of IND itself. With respect to definition, a number of conflicting conceptions of IND, available in the literature, were identified. In evaluating any IND research it is important to determine the important parameters of the study: Was IND conceived as a relatively formless, casual non-directed activity, or was it vigorously pursued with considerable faculty guidance? What kinds of students participated, and what did they study? Did the IND student receive the benefit of periodic quizzes on his work? Were the students trained for independent study or did they work haphazardly? The degree of intervention of these types will affect the efficacy of IND.

The failure to find any decided advantage for IND that can be confirmed from an assessment of research studies reflects in part some of the criticism of IND which has appeared from time to time. Some writers have felt that an emphasis on individual attainment while consistent with the democratic ideal of respect for the individual, may, if carried to excess, run counter to another democratic ideal, viz., cooperation and joint action. Also, it is not clear that students, left to themselves, will address their courses with the necessary application. IND may afford a serious student an excellent opportunity for the enlargement of his perspectives, greater use of his potential, etc.; others may need more of the kind of guidance that traditional education entails.

Faced by difficulties in showing academic advantages for IND, some writers have pointed to non-intellective gains; increased interest in subject matter, greater sense of academic responsibility and so forth, but the evidence for this is not conclusive.

HE 001 380

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

Since the research evidence to date is inconclusive, several questions remain to be answered. Instead of asking whether IND is superior to traditional methods, we should ask what differences are produced in what kinds of students under specific conditions. Does IND result in advantages as measured by traditional procedures, or does it result in changes that are hard to measure such as changes in attitude and motivation? Do students suffer from a lack of faculty supervision, contact, and pressure, and do they tend to waste time as a result? These questions must be answered before the utility of independent study can be conclusively evaluated.

(Copies of the full report are available from the Center for the Study of Higher Education)

Introduction

In surveying the literature on independent study, one finds a discrepancy between the repeated claims made for its desireability and the paucity of research effort invested in proving its efficacy. Thus, positive statements such as the following abound:

> The joy that should come from the satisfaction of intellectual hunger is too often lost in a system of higher education which too often insists that in order to learn, students must sit in classes for a set number of hours over a set number of weeks. (Baskin, 1965, p. 49)

> Not until the last forty-five years have undergraduate institutions conceded that a few of the brightest and most creative students might be allowed to sally forth into independent learning....The archival record of individual learning is at best a saga of rigidity. The only organization which has surpassed the schools in regimentation, standardization, and control, is the military. (Brown, 1968, p. 20)

> The more widespread use of reading periods... of examination on topics which students have studied on their own responsibility promises to increase the efficiency of learning.... (Educational Policies Commission, 1957, p. 97)

> To produce students who are effective in independent study is what education should be all about. (Griffin, 1965, p. 1)

But, as Gruber (1965) cautions:

> Before educational policy-makers are willing to support radical innovations, they rightly require evidence that the proposed changes are genuinely worth the trouble that all changes cause. (p. 4)

a plea which is all the more pressing to the extent that Cyphert's (1966) summary is valid:

> Studies concerned directly with independent study are inadequate in numbers and questionable in design. (p. 207)

The present paper is a review of the research evidence on independent study, hereafter referred to as IND.

Definition

It is not easy to settle on a precise definition of IND. "The nomenclature employed in connection with independent study...is confused and confusing." (Hatch & Bennet, 1960, p. 2). IND has been identified as individual study, self-directed study, study done outside of courses, as work done off campus, and as independent student learning. This variability is also emphasized by Dearing (1965) who points out that IND programs have ranged from those involving open, highly permissive relationships between student and instructor in which the student defines and develops his own plans to those characterized by a highly structured and guided relationship. In some settings IND is a completely solitary enterprise while in other settings there is small group contact or contact with the tutor, or combinations of these phases.

Gruber (1965) is more restrictive. He would reserve the term IND to "those teaching methods involving individual projects in which student and teacher are in a one-one relationship" (p. 1). He distinguishes IND from self-directed study where the course system is preserved but the proportion of time devoted to formal classroom meetings is reduced. Baskin (1960, p. 3), however, defines IND in such a way that it resembles Gruber's definition of "self-directed study" in that IND can take place in small groups, and in a situation where regular classroom periods are reduced, but not altogether eliminated.

Faced with the plethora of meanings assigned to IND, Griffin (1965) sidestepped the issue of a succinct definition and presented a two page "systems approach" breakdown.

The definition employed in the present paper is non-committal. In surveying the evidence, a study was included if the particular author represented it as one which examined IND. This means that many of the reported studies will not be directly comparable with one another since the definitions of IND will vary.

History

Bonthius *et al* (1957) and Brown (1968) have sketched the history

of IND, suggesting its spiritual beginning in Harvard's introduction of the elective system in 1869. Early IND programs were employed at Princeton (1905), Reed (1911), and Rice (1913). Swarthmore (1921) took IND out of the required program for upperclassmen and made it the prerogative of the brighter students. Several colleges quickly followed this procedure so that in 1924 Aydelotte was able to find 75 institutions which reported some use of IND. Later, in 1944, Aydelotte identified 130 accredited colleges and universities with serious IND programs, while Bonthius, Davis and Drushal (1954) found that 286 or 26% of the institutions studied used it. Ten years later, Felder (1964) reported that 68% of the colleges and universities queried used some form of IND. A more recent development involves experimentation with IND for all students in all classes, and inter-term plans where classes are suspended and all students engage in IND (Dearing, 1965; Bolger, 1968). The intensive use of IND has been a cornerstone of the curriculum of the "new" or experimental colleges (Hatch, 1960; Baskin, 1960).

Research

It might be fruitful to sample some of the summary evaluations of IND made by earlier reviewers.

> As with other comparisons of teaching methods, few differences have been found between achievement of students working independently and that of those taught in conventional classes. Moreover, the expected gains in independence have failed to materialize. Students taught by independent study do not always seem to develop greater ability or motivation for learning independently. (McKeachie, 1962, p. 340)

Baskin (1960) cited a report of the Fund for the Advancement of Education based on 16 researches on IND:

> Almost without exception, the customary academic examinations showed that students in the independent study experiments learned at least as much as the students who had regular class work. Rarely were there statistically significant differences in the performance of the experimental and the control groups on regular or special examination. (p. 7)

> Research workers...recognize that educational experiments in self-directed study fail to yield dramatic or even consistent results. In the face of negative results, (i.e., "no harm done") many educators cling to their belief in the efficacy of lectures or other formal classroom meetings; likewise, many psychologists optimistically cling to the hope that a convincing demonstration of the efficacy of self-directed study is "just around the corner" (Gruber, 1965, p. 2).

The consensus is perhaps best expressed by Dearing's (1965) reluctant admission:

> ...the results are not as significant as proponents of the independent study approach might hope (p. 65).

The level of optimism in this area would seem to depend on one's expectations. Some IND advocates may be pleased with findings of no difference either because it shows "no harm has been done" or because traditional learning has not been shown to be better, or they may have confidence in certain possible non-intellective advantages of IND and think faculty time may be saved as well. On the other hand, those less favorably inclined might demand clear proof of the superiority of IND before recommending its utilization.

In the present survey of the literature, reference will be made to much of the original material on which the foregoing summary statements are based as well as to a few additional studies, occurring for the most part after the earlier statements had been published.

The research evidence can be related to five categories supporting one or more of the following propositions:

I. IND is superior to traditional methods in terms of learning efficacy.

II. IND is inferior to traditional methods in terms of learning efficacy.

III. There is no difference between IND and traditional methods with respect to learning efficacy.

IV. An advantage of IND is that students appreciate the course more or are better motivated for further work.

V. Personality differences among students are related to success with IND methods.

I. IND is Superior

Hartnett and Stewart (1966) studied six groups of IND students who were matched with students taught in the traditional manner. In every instance, mean scores on final examinations were higher for the IND group; in two of the courses the difference was statistically significant. McKeachie (1963) cites two studies (Gruber & Weitman, 1960; Weitman & Gruber, 1960), both of which attest to the relative superiority of IND. Gruber & Weitman compared a freshman English class with a self-directed study group and found significant differences favoring the self-directed group on a test of grammar. Weitman and Gruber's students were enrolled in a class in physical optics. The IND students learned fewer facts at first but the disadvantage disappeared after three months. The IND group was superior throughout the study period, however, in difficult applications of their learning in relation to new materials. Alpern (1966) reported that an IND group of chemistry students did slightly better on course examinations than did students attending only recitation sections.

II. IND is Inferior

McKeachie, Lin, Forrin, and Teevan (1960) found that conventionally taught students did better on their final examinations than did a group of students who met only once a week to clear up questions on their textbook reading. Novak (1958) showed that students in a general botany course learned more facts than students using a project method. Marr, Plath, Wakely, and Wilkins (1960) found that lectured students do better than other classes merely engaged in reading with question and answer periods, as measured by scores on objective examinations.

III. IND and Traditional Equal

Churchill, for her doctoral dissertation (1960) worked with general education students using three groups: the first taught by traditional methods; the second meeting in small groups; and the third

spending half of its time in IND. All three methods produced little gains in learning resourcefulness. Goldstein (1956) compared pharmacology students taught by standard laboratory procedures with students taught by the project method and found no difference between the two groups. Jensen (1951) compared four groups, including one in which students were completely excused from class attendance. There was no difference in gains among the four groups. Seashore (1928) in a study of guided IND and written reports found no difference in the final examinations of these students as compared with students taught by the lecture method. Parsons (1957) found that IND and formal classroom procedures were equally effective as did Boyd-Bowman (1968) who compared students studying little used languages. In the Boyd-Bowman investigation, students worked at their own speed in association with foreign students who acted as drill masters (not instructors). Elich (1968) used a sample of students in a teacher education program and found no difference in grades received, retention or transfer.

Gruber (1965) reports on a "carefully controlled" experiment by Campbell (1963) in which:

> emphasis was placed on equating materials used by different groups, using each student in both self-directed and teacher-directed methods, and conducting both methods of instruction under individualized learning conditions.... (p. 4)

Despite these precautions, writes Gruber, Campbell's conclusion was "strikingly similar to the closing paragraphs of most field studies: 'Finally, it is worth noting that in no experiment did self-direction have an adverse effect on learning.'" Campbell is apparently not prepared, however, to argue that IND has a consistently positive effect either.

Baskin (1960) reported on the results of a study of three colleges with experimental IND programs: Oberlin, Antioch, and Vanderbilt University. Based on experience with a wide variety of courses, employing in some instances experimental and control sections in the same course, it was concluded that differences between IND and traditional methods were "by and large insignificant." (p. 6)

IV. Non-Intellective Advantages for IND

Those who favor IND often stress its non-intellective advantages and point out that these are difficult to measure. By this procedure they continue to emphasize its utility even when there is little objective evidence for the academic superiority of the method.

Elich's (1968) students judged IND as "more efficient" and McKeachie et al (1960) found that IND students expressed greater interest in the subject matter and had a more favorable impression of the course than did the traditionally taught students. Their interest persisted after the course was over as indicated in the greater number of advanced courses elected in the field in which the IND occurred. A continued interest is also indicated by Jensen (1951) whose IND students were more willing to volunteer for further IND.

An advantage of a totally different kind is noted by Baskin (1960), viz., there was a saving of faculty time. The last point is of interest in relation to the Tufts University proposal for an intersession IND program (1968) where a major faculty concern was that IND would be an increased burden on their time. The different assessment of the effect of IND on faculty time may be relatable to different academic conditions. If the students are able to work productively without supervision this tends to free the instructor from some of the pressures of continuous contact. On the other hand, if IND is conceived as a period of extra-curricular faculty tutoring or guidance then the demands made on faculty time will most naturally tend to increase.

V. Personality Factors in Relation to IND

Bigelow and Egbert (1968) were primarily interested in studying personality factors in relation to IND. Traditionally taught students were compared with an IND group which did not meet for formal instruction. The California Personality Inventory (CPI) was administered to all students. CPI scores of successful students (those who did better than their previous GPA's) in the IND group were not significantly different from scores of successful traditionally taught students. However, significant differences did appear in an analysis of the IND group, taken by itself. Successful IND students tended to score higher than unsuccessful IND students on such variables as intellectual efficiency and responsibility.

McKeachie (1963) reports that Timmel (1954) showed in his doctoral dissertation that there was no difference between a lecture and project method in changing adjustment.

In Chickering's (1964) study of Goddard students, he had the faculty choose the five students who best represented the model of independent academic performance. Nine out of 11 scales of the Omnibus Personality Inventory discriminated in the hypothesized direction, that is the selected independent students were higher on such scales as social maturity, originality and liberalism. They also showed better control and were more highly motivated scholastically.

Koenig and McKeachie's (1959) main hypothesis was that students with high need for achievement should perform better in IND situations. The students were enrolled in an elementary psychology course. During a two week period the students were divided: some wrote papers independently; some went to small discussion groups in lieu of classes. The California Personality Inventory was administered and measures of TAT need for achievement, need for affiliation, and need for power were obtained. Counter to expectation, high need for affiliation students did not perform better in small group discussions (although Beach, 1960, found they did) and high need for achievement did not differentiate male students. High need for achievement women, however, preferred the innovations. Among other differences it was found that high need for power males participated more in small group discussion than did low need for power males, but an inverse relation was obtained for females. In a subsequent study the findings confirmed the obvious expectation that authoritarian students should do poorly in IND.

Evaluation

It can be seen that a few studies indicate superiority for one method or another and a few call it a draw. Generalizations are made difficult by the multiplicity of factors involved, nature of sample, efficiency with which method is pursued in particular case, course material studied, duration of study, degree of access to faculty or other students, and so forth.

Certainly the precise way in which IND is defined is an important consideration. In one case IND might involve a great deal of intensive study outside of the classroom while in other cases IND might be a minor aspect of a regular course handled in a routine manner or in a way which demanded little real student initiative. In some instances the scope of instruction in IND phases, using periodic quizzes and frequent question and answer periods, seemed more comprehensive than typical traditional instruction. Such features do not reflect on the value of IND per se, but on the manner in which IND is executed.

Occasionally specific methodological characteristics of a study loom large when one wishes to assess the import of the findings. For example, returning to the studies previously cited, in the Hartnett and Stewart design the students enrolled in the IND group were superior students. Students from the traditional classes were selected to match these. Consequently, the reported result (an advantage for IND) is based on IND for superior students only.

In the experiment by Alpern the chemistry IND students had access to faculty directed quiz sessions. One can only speculate on

what learning would have transpired in the absence of these periodic quizzes, or in the absence of the "question and answer" periods utilized by Marr, Plath, Wakely, and Wilkins.

Also relevant to the latter study is a purely quantitative consideration, for Marr et al assigned lecture classes to four sessions a week whereas the reading students met for their question and answer periods only once a week. The imputed inferiority of the reading (IND) method must be assessed in the light of this fact which is buttressed by the additional information that a significant number of IND students said that an increase in the IND group's question and answer periods would have brought greater satisfaction.

Similarly, in the Churchill dissertation, where no differences were found, the "dosage" level of IND was limited to a class which spent half of its time in independent study. What the effect would be of extending this proportion of IND time up through complete IND assignment is of course not known.

Sometimes the tutoring methods are of critical importance. Boyd-Bowman reports that students who studied with the aid of "foreign" drill masters did as well as traditionally taught students. Although the author emphasizes that the drill masters were not instructors, certainly the level of expert assistance was high. In addition, the aid of an individual who offers help in his native tongue is an uncontrolled factor, since it can be expected that the traditional instructors were not always native to the language being taught.

Cautious Comments Concerning IND

Considering the weak support for IND generated by experimentation, it is not surprising that some writers have openly expressed their reservations concerning it, or at least are disturbed by the possibilities for its misapplication.

In a study at Wooster College, for example, Bonthius, et al (1957), mentioned certain drawbacks inherent in such descriptions of IND as "a freedom which engenders procrastination," suggestions of a need for "closer supervision" and of complaints concerning "lack of preparation."

Then there is Berelson (1960) who writes:

> There is a narrow line between more independence for the students and less concern for them--between independent work on the one hand and faculty neglect on the other. In any case independent study is a value not without its cost, and it is not altogether clear just how valuable it really is....(p. 208-209)

One indication of what this cost might be is suggested by Gruber (1965):

> ...maximal independence is only an intermediate goal. If the student were to remain in such a solipsistic state indefinitely, we might begin to complain that he was an asocial recluse. We do not want to substitute the hermit's cave for its own anthill. Our aim is not independence for its own sake...we must give deeper thought to the kind of human relationships our educational methods foster. Increasing self-reliance need not produce increasing alienation....the more advanced student could exercise and deepen his own knowledge by imparting it to others. (p. 9)

The caution sounded in the preceding passage is echoed in Wirth's (1966) pairing of individual and community values. Wirth submits that the concepts of individuality and community are both implied in the democratic ethos. Balance of the two forces is desired since an overemphasis on individual values, e.g., innovation, might if unchecked, lead to such consequences as self-indulgence, callousness, and anarchy. On the other hand, over concern with the merely social aspect may lead to conformity and the manipulation of the populace.

In view of the critical comment on both sides of the issue, and considering the lack of conclusive experimentation, it would appear that optimistic pronouncements regarding IND might best be toned down until such time as more definitive recommendations based on research can be advanced.

How can we put our research in the proper context? Certainly the sentiments of Harold Taylor must strike a resonant chord in the breast of any libertarian, in or out of academe.

> The present system of lectures, text books, survey courses, standard requirements of subject matter, examinations, and numerical grades...fails to touch the inner consciousness of the student or to deal with his motivations, his emotions, his aims, and his needs. (1956, p. 24)

But to believe in a certain goal is not the same thing as knowing how to achieve it or proving its value or convincing others that it can be achieved. The attributes of the scholar, perhaps summarized in the image of one who is capable of doing sustained creative and independent

work are fine enough. How do we get there? Must one be trained by IND methods to the exclusion of traditional instruction so as to be able to effectively utilize independent study at a point when maximum creativity is expected? Or can one learn to think for one's self in the company of others, in a milieu of instruction by others, if the instruction is wise, humane, tolerant and democratic? And if an essential ingredient is a certain amount of IND, how much? These are the questions for research to answer.

Conclusions and Research Suggestions

Considering the importance of the decisions to be made regarding independent study, the research results have been of minimal utility. The implications of the research are inconclusive. Based on the evidence to date, which leaves much to be desired, one can conclude that the effects of IND are in many cases not very different from the effects of more traditional teaching methods. While some studies have shown IND to be better, others have shown it to be inferior. It does not appear to be possible to isolate the variables that account for the diversity in the results.

The ambiguity of the results may be due in part to the fact that the wrong research question was asked. Instead of asking simply "Is IND superior to more traditional methods of teaching?" a more complex question is needed. One could well ask "In what ways is IND superior, for what kinds of students, with what kinds of training, studying what subjects, with what degree of faculty interaction?" By asking these more complex questions, both theoretically reasonable and consistent answers might be obtained.

Other basic questions relate to whether there are some hard to test advantages of IND such as instilling respect for scientific methods of inquiry, increasing motivation for further study, encouraging creativity, and developing positive attitudes toward learning. Among the negative questions one should ask whether students will feel deprived by a lack of conventional faculty supervision, whether they will flounder or waste time in IND programs, and whether immersion in independent study will discourage the development of socially responsible patterns of co-operative behavior. Only when many of these questions can be answered will it be possible to conclusively evaluate the utility of independent study.

References

Alpern, Dwight K. In place of recitations: An experiment in teaching. Teachers College Record, 1966, 67, 589-594.

Aydelotte, Frank. Honors courses in American colleges and universities. Bulletin of the National Research Council, 1924, 7, 9-18.

Aydelotte, Frank. Breaking the academic lockstep. New York: Harper, 1944.

Baskin, Samuel. Introduction to Bruce Dearing, The student on his own. In Samuel Baskin (Ed.), Higher education: some newer developments. New York: McGraw-Hill, 1965.

Baskin, Samuel. Quest for quality. New dimensions in higher education, no. 7. Washington, D.C.: U.S. Office of Education, 1960.

Beach, Leslie R. Sociability and academic achievement in various types of learning situations. Journal of Educational Psychology, 1960, 51, 208.

Berelson, Bernard. Graduate education in the United States. New York: McGraw-Hill, 1960.

Bigelow, Gordon S. & Egbert, Robert L. Personality factors and independent study. Journal of Educational Research, 1968, 62, 37-39.

Bolger, James. In January, Tufts students will "do their own thing." Business Education World, 1968, 49, 2.

Bonthius, Robert H., Davis, F. James, & Drushal, J. Garber. Independent study programs. Journal of Higher Education, 1954, 25, 411-416.

Bonthius, Robert H., Davis, F. James & Drushal, J. Garber. The independent study program in the United States. New York: Columbia University Press, 1957.

Boyd-Bowman, Peter. Experimentation with taped materials and native informants to develop for small colleges some program of independent study in the neglected languages. Abstracted in: Educational Resources Information Center (ERIC) Research in Education, 1968, 3, ED 010 401.

Brown, Bartley F. Education by appointment: new approaches to independent study. West Nyack, N.Y.: Parker, 1968.

Chickering, Arthur W. Dimensions of independence. Journal of experimental education, 1964, 32, 313-316.

Churchill, Ruth Dietz. Evaluation of independent study in college courses. Unpublished doctoral dissertation, University of Minnesota, 1960 (Dissertation Abstracts, 1961, 1841-1842).

Cyphert, Frederick R. Independent study, panacea? fraud? Theory into Practice, 1966, 5, 205-208.

Dearing, Bruce. The student on his own: independent study. In Samuel Baskin (Ed.), Higher education: some new developments. New York: McGraw-Hill, 1965, pp. 49-77.

Educational Policies Commission. Higher education in a decade of decision. Washington, D.C., 1957.

Elich, Peter J. Independent study at the college level. Abstracted in: Educational Resources Information Center (ERIC) Research in Education, 1968, 3, ED 010 797.

Felder, Dell. Independent study practices in colleges and universities. Journal of Higher Education, 1964, 35, 335-338.

Goldstein, Avram. A controlled comparison of the project method with standard laboratory teaching in pharmacology. Journal of Medical Education, 1956, 31, 365-375.

Gruber, Howard E. The future of self-directed study. In Winslow R. Hatch & Alice L. Richards (Eds.), Approach to independent study, New dimensions in higher education, no. 13. Washington, D.C.: U.S. Office of Education, 1965, pp. 1-10.

Gruber, Howard E. & Weitman, Morris S. Cognitive processes in higher education: Curiosity and critical thinking. Paper read at Western Psychological Association, San Jose, Calif., April, 1960.

Griffin, William M. Schedules, bells, groups, and independent study. In David W. Beggs, III & Edward G. Buffie (Eds.), Independent study, bold new venture. Bloomington: Indiana University Press, 1965, pp. 1-8.

Hartnett, Rodney T., & Stewart, Clifford T. Final examination grades of independent study students compared with those of students taught by traditional methods. Journal of Educational Research, 1966, 59, 356-357.

Hatch, Winslow R. & Bennet, Ann. Independent study. New dimensions in higher education, no. 1. Washington, D.C.: U.S. Office of Education, 1960.

Hatch, Winslow R. The experimental college. New dimensions in higher education, no. 3. Washington, D.C.: U.S. Office of Education, 1960.

Jensen, Barry T. A comparison of student achievement under conditions of class attendance and non-attendance. College and University, 1951, 26, 399-404.

Koenig, Kathryn and McKeachie, Wilbert J. Personality and independent study. Journal of Educational Psychology, 1959, 50, 132-134.

Marr, John N., Plath, Dean W., Wakely, John H., and Wilkins, Donald M. The contribution of the lecture of college teaching. Journal of Educational Psychology, 1960, 51, 277-284.

McKeachie, Wilbert J. Procedures and techniques of teaching: a survey of experimental studies. In The American college. New York: John Wiley, 1962, pp. 312-356.

McKeachie, Wilbert J. Research on teaching at the college and the university level. In N.L. Gage (Ed.), Handbook of research on teaching. Chicago: Rand McNally, 1963, pp. 1118-1172.

McKeachie, Wilbert J., Lin, Yi Guang, Forrin, Bert, and Teevan, Richard. Individualized teaching in elementary psychology. Journal of Educational Psychology, 1960, 51, 285-291.

Novak, Joseph D. An experimental comparison of a conventional and a project centered method of teaching a college general botany course. Journal of Experimental Education, 1958, 26, 217-230.

Parsons, Thomas S. A comparison of instruction by kinescope, correspondence study, and customary classroom procedures. Journal of Educational Psychology, 1957, 48, 27-40.

Seashore, Carl E. Elementary psychology: An outline of a course by the project method. Aims and Progress of Research, No. 153. Iowa City: University of Iowa, 1928.

Taylor, Harold. The world of the American student. Current issues in higher education, Washington, D.C.: National Education Association, 1956.

Timmel, Gustave B. A study of the relationship between method of teaching a college course in mental hygiene and change in student adjustment status. Unpublished doctoral dissertation, Cornell University, 1954. (Dissertation Abstract, 1955, 15, 90)

Weitman, Morris, and Gruber, Howard E. Experiments in self-instructed study: Effects on immediate achievement, performance of achievement and educational values. Paper read at Western Psychological Association, San Jose, California, April 1960.

Wirth, Arthur G. A perspective for independent study. Theory into Practice, 1966, 5, 209-212.